

REMARKS

Claims 1-15 and 19-26 are pending in this application. By this Amendment, claims 16 and 17 are canceled, claims 1, 15 and 20 are amended and new claims 21-26 are added. The amendments to claims 1 and 15 distinguish the claimed invention over the teachings of Tsutsumi as discussed more fully below.

No new matter is added by this Amendment. Support for the amended language and new claims is discussed in the arguments for each claim below.

I. June 4, 2004 Information Disclosure Statement (IDS)

As a reminder to the Patent Office, an Information Disclosure Statement (IDS) was filed in the U.S. Patent and Trademark Office on June 4, 2004. Applicant respectfully requests the Patent Office to review the IDS and references, and initial, sign and return the PTO-1449 with the next communication from the Patent Office.

II. Rejection Under 35 U.S.C. §102(e)

Claims 16 and 17 were rejected under 35 U.S.C. §102(e) as allegedly being unpatentable over U.S. Patent No. 6,437,090 (Murai). This rejection is respectfully traversed.

In particular, Applicant has canceled claims 16 and 17 by this Amendment. Accordingly, this rejection is now moot. Reconsideration and withdrawal of the rejection are thus respectfully requested.

III. Rejection Under 35 U.S.C. §103(a)

Claims 1-15, 19 and 20 were rejected under 35 U.S.C. §103(a) relying upon U.S. Patent No. 6,361,879 (Tsutsumi) in view of U.S. Patent No. 6,555,602 (Harada). This rejection is respectfully traversed.

A. Claim 1

Claim 1 is amended to specify that the adhesive is in the form of a paste. This amendment is supported by the specification at, for example, page 16, lines 7-8.

Tsutsumi discloses a sealed semiconductor chip having a surface film of a sealed resin composition, wherein the resin composition has a specified linear expansion coefficient. The semiconductor-sealing resin composition creates a good seal on chip wafers and has high reliability, and the chip wafers sealed with a surface film of the resin composition warp little. See the Abstract. The sealing resin is described to comprise an epoxy resin, a curing agent and a filler, as well as possibly a curing catalyst, a coupling agent, a flame retardant, etc. See columns 3 and 4. Tsutsumi differs from the claimed invention in several respects that are not remedied by Harada.

The resin composition of Tsutsumi is solid. As described at column 6, lines 18-24, the resin composition is formed by blending the components together dry. For applying the resin composition of Tsutsumi on a wafer, it is necessary to apply high pressure and high temperature to the resin composition using, e.g., a transfer molding machine. See column 9, lines 43-47 of Tsutsumi. Thus, the resin composition of Tsutsumi cannot be a paste as required in amended claim 1.

Further, again as described at column 6, lines 18-24, the resin composition is described to be blended together dry without any treatment in Tsutsumi. As such, as acknowledged by the Patent Office, it is clear that any of the optional curing catalyst such as metal chelate that might be present is not microcapsulated. Applicant submits that one of ordinary skill in the art would not have been led to microcapsulate the curing catalyst if present, contrary to the assertions of the Patent Office.

Because the resin in Tsutsumi is a solid and not a paste as discussed above, premature curing action of the resin composition of Tsutsumi is prevented without having to microcapsulate the curing catalyst. Thus, because premature curing action of the resin composition of Tsutsumi is prevented without the use of microcapsulating, it is not necessary to microcapsulate the metal chelate of Tsutsumi. Even though Harada discloses a

microcapsulated catalyst, one of ordinary skill in the art would have recognized that even though such is known, microcapsulation was not necessary in the composition of Tsutsumi.

Further, Tsutsumi would direct one of ordinary skill in the art away from microcapsulating the optional curing catalyst of Tsutsumi. For post-curing, the resin composition of Tsutsumi requires a lengthy heating (e.g., 5 hours) at high temperature (e.g., 180°C), even though the curing catalyst is dispersed without microcapsulating. See column 9, lines 47-48 of Tsutsumi. Therefore, if the microcapsulating described in Harada were to have been applied to the curing catalyst of Tsutsumi, the heating time for post-curing would become even longer than 5 hours. The resin composition of Tsutsumi would thus not be of practical use if microcapsulation were employed with the curing catalyst additive.

That is, microcapsulating may be useful for an adhesive in the form of paste or a semi-cured adhesive, but has no use in solid resins such as described in Tsutsumi.

Thus, since the curing catalyst of Tsutsumi would not have been microcapsulated based upon the teachings of Harada as described above, claim 1 is not obvious from Tsutsumi in view of Harada.

Finally, Applicant notes that while Tsutsumi indicates that the resin composition may optionally include a curing catalyst or a silane coupling agent, Tsutsumi does not teach that such materials must be present in the composition. Further, among the numerous optional curing catalysts, metal chelate type compounds are mentioned as only one such curing catalyst. Tsutsumi does not teach that the metal chelates are preferred if a curing catalyst is used (see column 4, lines 38-41) and does not use a metal chelate curing catalyst in any example composition shown therein. Applicant respectfully submits that such teachings are insufficient to find that one of ordinary skill in the art would have been led to the adhesive of claim 1 that must contain a resin, a silane coupling agent and a microcapsulated metal chelate. Nothing in Tsutsumi would have directed or motivated one of ordinary skill in the art to have

made the necessary selections to have derived the adhesive of claim 1 that contains both a silane coupling agent and a metal chelate. Curing catalysts and coupling agents are both optional in Tsutsumi, and metal chelates are not preferred curing catalysts in Tsutsumi. Harada also fails to suggest selection of these components in Tsutsumi, and thus the references fail to teach or suggest claim 1 for this additional reason.

For the foregoing reasons, neither Tsutsumi nor Harada teach or suggest the adhesive of claim 1. Consequently, reconsideration and withdrawal of the 35 U.S.C. §103(a) rejection based upon the teachings of Tsutsumi and Harada are requested.

B. Claims 2-7 and 9-14

Claims 2-7 and 9-14 each depend, directly or indirectly, from claim 1 discussed above. Because Tsutsumi and Harada fail to teach or suggest the invention of claim 1, these dependent claims are each further distinguishable over these references.

C. Claim 8

Claim 8 depends from claim 1 and adds that the amount of the metal chelate is from 0.1 parts by weight to 20 parts by weight with respect to 100 parts by weight of the resin component and an amount of the silane coupling agent is from 0.1 parts by weight to 35 parts by weight with respect to 100 parts by weight of the resin component.

Claim 8 also depends from claim 1, and thus here again because Tsutsumi and Harada fail to teach or suggest the invention of claim 1, the references also fail to teach or suggest the invention of dependent claim 8.

In addition, Tsutsumi discloses a resin composition wherein an amount of a curing catalyst, which may be a metal chelate, is from 0.01 parts by weight to 10 parts by weight with respect to 100 parts by weight of the resin. See column 4, lines 43-46. However, neither Tsutsumi nor Harada discloses the amount of the silane coupling agent.

The adhesive of the present invention is cured by cationic polymerization, which occurs with the reaction of the metal chelate and the silane coupling agent. On the contrary, the resin compositions of both Tsutsumi and Harada are cured by anionic polymerization of a thermosetting resin and an anhydride curing agent via reaction of the catalyst.

If the same amount of silane coupling agent required in present claim 8 is applied to a resin composition of Tsutsumi with the metal chelate, the required anionic polymerization would be prevented by the cation that is generated by the reaction of the metal chelate and the silane coupling agent. Therefore, the same amount of the silane coupling agent as recited in claim 8 cannot be used in the resin composition of Tsutsumi and Harada.

Consequently, Tsutsumi and Harada also fail to teach or suggest the additional limitations of claim 8.

D. Claim 15

Regarding claim 15, the Patent Office noted that the prior claim term "obtainable" was allegedly open to other methods of "obtaining" the adhesive film. By this Amendment, claim 15 is amended to replace the term "obtainable" with "obtained."

Claim 15 is further amended to recite that the metal chelate is microcapsulated "so as to be a microcapsule, and the microcapsule is dispersed in the adhesive film." This amendment is supported by the description at, for example, page 16, lines 5-6 and page 30, lines 5-7 of the present specification.

In addition to claim 15 not being taught or suggested by the cited prior art for the same reasons discussed above with respect to claim 1, Applicant notes that the adhesive film of present claim 15 is not cured (see page 13, lines 18-21 of the present specification), and the adhesive film has adhesiveness (see page 14, lines 10-12 of the present specification). On the contrary, films of Tsutsumi and Harada, which the Patent Office cited, are post-cured (see column 9, lines 43-50 of Tsutsumi and column 2, lines 16-17 of Harada). Therefore,

Applicant submits that the films described in Tsutsumi and Harada do not teach or suggest the film as recited in claim 15 because the films would not have a microcapsulated metal chelate dispersed in the adhesive film as required by claim 15.

Moreover, Applicant again notes that while Tsutsumi indicates that the resin composition may optionally include a curing catalyst or a silane coupling agent, Tsutsumi does not teach that such materials must be present in the composition. Further, among the numerous optional curing catalysts, metal chelate type compounds are mentioned as only one such curing catalyst. Tsutsumi does not teach that the metal chelates are preferred if a curing catalyst is used (see column 4, lines 38-41) and does not use a metal chelate curing catalyst in any example composition shown therein. Applicant respectfully submits that such teachings are insufficient to find that one of ordinary skill in the art would have been led to the adhesive film of claim 15 that must contain a resin, a silane coupling agent and a microcapsulated metal chelate. Nothing in Tsutsumi would have directed or motivated one of ordinary skill in the art to have made the necessary selections to have derived the adhesive film of claim 15 that contains both a silane coupling agent and a microcapsulated metal chelate. Curing catalysts and coupling agents are both optional in Tsutsumi, and metal chelates are not preferred curing catalysts in Tsutsumi. Harada also fails to suggest selection of these components in Tsutsumi, and thus the references fail to teach or suggest claim 15 for this additional reason.

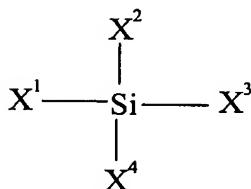
Consequently, the combined teachings of Tsutsumi and Harada do not meet the limitations of present claim 15. Reconsideration and withdrawal of the rejection with respect to claim 15 are respectfully requested.

E. Claims 21-25

Claims 21-25 are added by this Amendment, and include all of the limitations of claim 15. Tsutsumi and Harada fail to teach or suggest these dependent claims for all the same reasons discussed immediately above with respect to claim 15.

F. Claim 26

Claim 26 is added by this Amendment, and recites an adhesive comprising a resin component, a metal chelate, and a silane coupling agent, wherein the resin component comprises a thermosetting resin and the silane coupling agent comprises a silane compound represented by general formula:



wherein at least one of substituents X¹ through X⁴ is an alkoxy group, and wherein if one or more of the substituents X¹ through X⁴ is a substituent other than alkoxy group, such substituent other than alkoxy group is a substituent that includes in its structure a functional group selected from a group consisting of epoxy ring, vinyl group, amino group, mercapto group and methyl group, and wherein the silane coupling agent is microcapsulated.

The language of claim 26 is supported by the description at page 31, lines 3-5 of the present specification.

The resin composition of Tsutsumi optionally may contain a silane coupling agent (column 4, lines 47-56), but there is no description of microcapsulating the silane agent. The optional silane coupling agent of Tsutsumi is not used for curing the resin composition but is described as used for treating the surface of the filler prior to inclusion of the filler in the composition (see column 4, lines 47-52 of Tsutsumi).

If the silane coupling agent of Tsutsumi were microcapsulated, the surface of the filler would not be properly treated with the silane coupling agent as desired in Tsutsumi.

Accordingly, one of ordinary skill in the art would not have been led to have microcapsulated the silane coupling agent. Harada does not suggest otherwise.

As described above, neither Tsutsumi nor Harada teach or suggest claim 26. Accordingly, claim 26 should also be found to be patentable over the teachings of Tsutsumi and Harada.

G. Conclusion

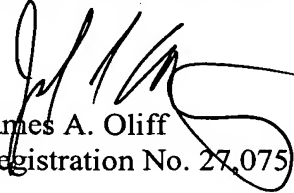
For the foregoing reasons, Applicant submits that Tsutsumi and Harada, alone or in combination, do not teach or suggest any of the present claims.

IV. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-15 and 19-26 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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